Abstracts

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T. YAMASAKI, K. HATA and T. HIGUCHI: **Chemical Properties of Enzymic Dehydrogenation Polymer from *p*-Coumaryl Alcohol**, MOKUZAI GAKKAISHI, **18**, 361 (1972).

Enzymic dehydrogenation polymers (DHP) prepared from *p*-hydroxycinnamyl alcohols were subjected to alkaline nitrobenzene oxidation, acidolysis, and alkaline potassium permanganate and hydrogen peroxide oxidation. The degradation products of the DHP were analyzed by gas-liquid chromatography.

The chromatograms showed that DHP prepared from *p*-coumaryl alcohol yielded a consider able amount of *p*-hydroxybenzaldehyde and 2-hydroxy-1-(4-hydroxyphenyl)-1-propanone by nitrobenzene oxidation and acidolysis, which suggest the presence of *p*-hydroxyphenylglycerol-*β*-*p*-coumaryl ether structure. The presence of anisic, 4-methoxyisophthalic and 3, 3′-dehydrodianisic acids with a trace of methoxytrimesic acid was shown in the oxidation phenolic acids by permanganate and hydrogen peroxide. The molecular ratio of dimethyl 4-methoxyisophthalate to methyl anisate was very similar to that of dimethyl isohemipinate to methyl veratrate. The molecular ratio of dimethyl 3, 3′-dehydrodianisate to methyl anisate was also similar to that of dimethyl 5, 5′-dehydrodiveratrate to methyl veratrate. These results indicated that the degree of condensation at C-3 and C-5 between the DHP of *p*-coumaryl alcohol and of coniferyl alcohol differs little, and that the possibility of double condensations at C-3 and C-5 of the *p*-hydroxyphenyl component in the DHP from *p*-coumaryl alcohol is quite small.

K. KONISHI, Y. INOUE and T. HIGUCHI: **Decomposition of Lignin by *Coriolus versicolor* IV. Effect of Laccase Type Enzyme on the Interphenylpropane Linkage of Lignin**, MOKUZAI GAKKAISHI, **18**, 571 (1972).

This report was concerned with the effect of polyphenol oxidase (laccase type) of *Coriolus versicolor* on the interphenylpropane linkage of milled wood lignin (MWL) prepared from Sugi sapwood.

As main differences between the enzyme treated MWL and MWL itself, the following facts were established, namely, that the former gave (1) lower amounts of vanillin in nitrobenzene oxidation. (2) lower amounts of acidolysis monomers, and (4) higher amounts of phenolic hydroxyl groups bound to condensed units of lignin.

From these results as well as the results previously reported,[1)] it is clear that a part of non-condensed units of MWL is converted to condensed units through radical reaction caused by the enzyme, without resulting to appreciable amounts of low molecular weight compounds.

Besides, the enzyme seems to catalize at least the conversion of terminal residues of non-condensed units of MWL to carboxyl containing residues, without cleavage of *α*- and *β*-aryl ether bonds.

M. SHIMADA, H. FUSHIKI and T. HIGUCHI: **Mechanism of Formation of Syringyl Components in Lignin**, PHYTOCHEMISTRY, **11**, 2247 (1972).

-Various labelled compounds including ferulic acid-$O^{14}CH_3$ were administered to a bamboo and a grass to study the biosynthesis of syringyl lignin. It was found that ferulic acid was demethoxylated to *p*-coumaric acid in sliced bamboo tissues. However, the analytical data obtained by

nitrobenzene oxidation and ethanolysis of the fed plant showed that ferulic acid-$O^{14}CH_3$ was incorporated into syringyl units as well as into guaiacyl units without rearrangement of the labelled methoxyl group. This finding supports the early indication that ferulic acid can serve as a precursor of syringyl lignin.

M. SHIMADA, H. FUSHIKI and T. HIGUCHI: ***O*-Methyltransferase Activity from Japanese Black Pine**, PHYTOCHEMISTRY, **11**, 2657 (1972).

O-Methyltransferase catalyzing the methylation of caffeic acid to ferulic acid was extracted from growing pine seedlings. The partially purified enzyme required Mg ion for maximal formation of ferulic acid; divalent metals such as Co, Zn, Cd, and Ni ions potently inhibited the reaction. EDTA, PCMB and ICH_2-CO_2H also inhibited activity. The enzyme, exhibiting the maximal activity at pH 7.5, was found to be *meta*-specific for various catecholic substrates. Caffeic acid served as the best substrate among 16 phenolics tested; protocatechuic aldehyde and 3, 4-dihydroxyphnylacetic acid were methylated to a certain degree. On the other hand, 5-hydroxyferulic acid, an important precursor for syringly lignin, was a poor substrate. Thus, the pine enzyme differed markedly in substrate specificity from comparable enzymes from bamboo, poplar and callus tissues of angiosperms.

A. SATO, K. NISHIO and T. KITAMURA: **On the Ratio of Syringaldehyde to Vanillin (S/V value) of the Lignin in Peanuts (*Arachis hypogaea L.*) (note)**, J. Agr. Chem. Soc., Japan, **46**, 603 (1972).

Alcohol-benzene and hot water soluble matters, lignin and methoxyl contents were determined about the pod-shell, stem, root and leaves of peanut (*Arachis hypogaea* L.). Molar ratios of syringaldehyde to vanillin (S/V value), which were obtained by alkaline nitrobenzene oxidation and determined by gas-liquid chromatography, were 0.00, 0.31, 0.32 and 0.39 for pod-shell, stem, leaves and root, in order. These lower values from peanut which is classified as *Dicotyledonae* are very interesting on the viewpoint of chemotaxonomy. The S/V value of peanuts lignin was similar to that from *Gymnospermae*. The value, 0.03, was also obtained from the stem of *Chloranthus glaber* Makino.

K. SUMIYA: **Kozobutsu no Gaimen-Syori (The Exterior Treatment of Building Materials)**, Chap. 4, Kagaku-Kogyo-Sha (1972).

This book was translated by S. Matsuo, Professor of Faculty of Engineering, Kyoto University, and others into Japanese from "The Weathering and Performance of Building Materials" edited by J. W. Simpson and P. J. Horrobin.

The chemical and physical nature of wood, weathering characteristics of wood and other wood-based products, design considerations for timber cladding and the use of finishes on exterior timber are mentioned in Chapter 4.

The 24 th Public Lecture held by Wood Research Institute (October 20, 1972, Uji).

T. YAMADA: Material Design of Wood Stem

E. MAEKAWA: On Heimcelluloses of Ginkgo nut shell

F. NAKATSUBO: Dehydrogenation of Lignin Monomers

T. ITO: Histological studies on the formation of wood cell wall

H. KANEDA: Weatherability of Composite Wood

Y. HASEGAWA: On the Mechanical Behaviours during the Formation of Wood